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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/570,554

12/07/2006

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1187-44

5372

28249 7590 11/25/2009  
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EXAMINER

COLLINS, CYNTHIA E

ART UNIT

PAPER NUMBER

1638

MAIL DATE

DELIVERY MODE

11/25/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/570,554	<b>Applicant(s)</b> BROEKAERT ET AL.	
	<b>Examiner</b> Cynthia Collins	<b>Art Unit</b> 1638	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 24 August 2009.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,3-9,11-15,20 and 32-36 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-9,11-15,20 and 32-36 is/are rejected.
- 7) ☒ Claim(s) 3-9,11-15 and 20 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

The Amendment filed August 24, 2009 has been entered.

Claims 2, 10, 16-19 and 21-31 are cancelled.

Claims 1, 3-9, 11-12 and 20, are currently amended.

Claims 32-36 are new.

Claims 1, 3-9, 11-15, 20 and 32-36 are pending.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

All previous objections and rejections not set forth below have been withdrawn.

### ***Claim Objections***

Claims 3-9, 11-15 and 20 remain objected to because of the absence of an article at the beginning of the claim (claims 11-15 and 20) or because of the use of an improper article at the beginning of the claim (claims 3-9).

Appropriate correction is required.

It is suggested that dependent claims 3-9 and 11-14 be amended to recite “The method” in order to overcome the objection.

It is suggested that claim 15 be amended to recite “A plant obtainable by the method according to claim 6” in order to overcome the objection.

It is suggested that claim 20 be amended to recite “A method” in order to overcome the objection.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 1, and claims 3-9, 11-15 and 32-36 dependent thereon, are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. This is a new matter rejection. The method of claim 1 as currently amended does not find support in the specification as filed, and thus constitutes new matter.

Applicant's response filed August 24, 2009 indicates that support for the amendment of claim 1 may be found at page 25 corresponding to paragraph [0110] of the published application, and in Example 7 (reply page 12).

The Examiner maintains that page 25 corresponding to paragraph [0110] of the published application does not support the current amendment of claim 1. With respect to Example 7, the Examiner maintains that Example 7 supports a method that comprises introducing into a rice plant a nucleic acid molecule encoding a *Arabidopsis thaliana* CDK B1;1 B-type CDK protein of SEQ ID NO:2 operably linked to a beta expansin promoter of SEQ ID NO:14, a nucleic acid molecule encoding a *Arabidopsis thaliana* CDK B1;2 B-type CDK protein of SEQ ID NO:4 operably linked to a GOS2 promoter of SEQ ID NO:15, and a nucleic acid molecule encoding a *Arabidopsis thaliana* CDK B2;2

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B-type CDK protein of SEQ ID NO:6 operably linked to a GOS2 promoter of SEQ ID NO:15.

Claims 1, 3-9, 11-14, 20 and 32-36 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for methods of introducing into a rice plant a nucleic acid molecule encoding a *Arabidopsis thaliana* CDK B1;1 B-type CDK protein of SEQ ID NO:2 operably linked to a beta expansin promoter of SEQ ID NO:14, methods of introducing into a rice plant a nucleic acid molecule encoding a *Arabidopsis thaliana* CDK B1;2 B-type CDK protein of SEQ ID NO:4 operably linked to a GOS2 promoter of SEQ ID NO:15, and methods of introducing into a rice plant a nucleic acid molecule encoding a *Arabidopsis thaliana* CDK B2;2 B-type CDK protein of SEQ ID NO:6 operably linked to a GOS2 promoter of SEQ ID NO:15, wherein plants produced by the methods are screened or selected for increased yield, increased growth rate and modified architecture, does not reasonably provide enablement for methods that utilize other types of plants or constructs. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims.

The claims are broadly drawn to methods comprising introducing into any type of plant a nucleic acid molecule encoding any B-type CDK protein that comprises a PPTALRE motif (SEQ ID NO:26) with no mismatches or with a mismatch at position 2 and/or 4 from left to right, a catalytic kinase domain, and a T-loop activation kinase domain, or a nucleic acid encoding a CDK mutant, which CDK mutant comprises SEQ ID NO:9 having at least one of a Y substituted for an H at position 4, V substituted for a

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D at position 79 or an A substituted for a T at position 152; SEQ ID NO:10 having an I substituted for a T at position 30; or SEQ ID NO: 11 having at least one of an E substituted for a V at position 5, an R substituted for an S at position 122, or a K substituted for an E at position 143; and screening or selecting plants produced by the methods for increased yield, increased growth rate and modified architecture.

The specification discloses that rice plants transformed with a nucleic acid molecule encoding a *Arabidopsis thaliana* CDK B1;1 B-type CDK protein of SEQ ID NO:2 operably linked to a beta expansin promoter of SEQ ID NO:14, or a nucleic acid molecule encoding a *Arabidopsis thaliana* CDK B1;2 B-type CDK protein of SEQ ID NO:4 operably linked to a GOS2 promoter of SEQ ID NO:15, or a nucleic acid molecule encoding a *Arabidopsis thaliana* CDK B2;2 B-type CDK protein of SEQ ID NO:6 operably linked to a GOS2 promoter of SEQ ID NO:15, can be successfully screened and selected for increased yield, increased growth rate and modified architecture (Example 7). The specification does not disclose the effect of transforming rice plants with other types of constructs, or the effect of transforming other plant species.

The full scope of the claimed invention is not enabled because plants transformed with nucleic acids encoding B-type CDK proteins cannot be predictably screened and selected for increased yield, increased growth rate and modified architecture, since the transformation of plants with such nucleic acids does not always result in the desired phenotypes.

See, for example, Porceddu A. et al. (A Plant-specific Cyclin-dependent Kinase Is Involved in the Control of G<sub>2</sub>/M Progression in Plants. The Journal of Biological Chemistry, September 28, 2001, Vol. 276, No. 39, pp 36354-36360), who teach that

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transgenic tobacco plants overexpressing CDC2bAt or CDC2bAt-D161N under control of a strongly constitutive promoter show no discernable phenotype (page 36358 column 1 and Figure 6; page 36359 column 1).

In the instant case Applicants not provided sufficient guidance with respect to which nucleic acids encoding B-type CDK proteins to express, in which plant species, and using which types of promoters, such that the resultant plants can be successfully screened and selected for increased yield, increased growth rate and modified architecture. Absent such guidance it would require undue experimentation for one skilled in the art to practice the invention as claimed, as one skilled in the art would have to transform numerous different plant species with numerous different types of nucleic acids encoding B-type CDK proteins under the control of numerous different types of promoters, and then screen or select the resultant plants for increased yield, increased growth rate and modified architecture, in order to determine which combinations would produce the desired results.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 1, and claims 3-9, 11-15 and 32-36 dependent thereon, are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 1 is indefinite in part (f), because it is unclear what type of plant the increased parameter is being compared to.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 15 remains rejected under 35 U.S.C. 103(a) as being unpatentable over INZE D. et al. (WO 98/41642, published September 24, 1998) in view of Boudolf V. et al. (Identification of novel cyclin-dependent kinases interacting with the CKS1 protein of Arabidopsis. J Exp Bot. 2001 Jun;52(359):1381-2), for the reasons of record.

Applicants' arguments filed August 24, 2009 have been fully considered but they are not persuasive.

Applicants maintain that the combination of Inze et al. in view of Boudoir et al. does not render the present invention obvious since the teachings provided therein do not suggest the presently claimed method of improving plant growth characteristics selected from one or more of increased yield, increased growth rate and modified architecture comprising steps (a) through (f) as presently claimed (reply page 13).

Applicants arguments are not persuasive with respect to claim 15 because the method of manufacture does not distinguish the claimed plant from a plant produced by any method that introduces a nucleic acid molecule encoding a class 2 B-type CDK into a plant, as the claimed method only results in the production of plants into which a nucleic acid molecule encoding a class 2 B-type CDK has been introduced.



***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

***Remarks***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cynthia Collins whose telephone number is (571) 272-0794. The examiner can normally be reached on Monday-Friday 8:45 AM -5:15 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anne Marie Grunberg can be reached on (571) 272-0975. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Cynthia Collins/  
Primary Examiner, Art Unit 1638

CC